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10/075,224	02/15/2002	Dong-Ha Shim	030681-359	7856

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EXAMINER

MANDALA, VICTOR A

ART UNIT PAPER NUMBER

2826

DATE MAILED: 01/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/075,224

Applicant(s)

SHIM, DONG-HA

Examiner

Victor A Mandala Jr.

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 November 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 and 13-17 is/are rejected.
- 7) ☒ Claim(s) 9-12 and 18 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

1. The Applicant has amended the claims 2 and 14 to read around the 35 U.S.C. 112 first paragraph rejection. The examiner agrees with the amendment and claims 2 and 14 will be further examined.
2. The Applicant argues the 35 U.S.C. 112 first paragraph rejection based upon new matter. The examiner finds the arguments to be persuasive and the rejection is retracted. Claim 16 will be further examined.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

- Claims 1, 5, 13, and 17 are rejected under 35 U.S.C. 102(b) as being anticipated by Japanese Patent Publication No. 2000-164104 Seki.
3. Referring to claim 1, a MEMS device having flexible elements with nonlinear restoring force comprising: a substrate, (Figure 1B #11a); support elements, (Figure 1B #21), formed on the substrate, (Figure 1B #11a); a moveable element, (Figure 1B #25), floated over the substrate,

(Figure 1B #11a), by the support elements, (Figure 1B #21), so as to move; flexure elements, (Figure 1B #22), for elastically suspending the moveable element, (Figure 1B #25), on the support elements, (Figure 1B #21), a driving element, (Figure 1B #12), for moving the moveable element, (Figure 1B #25); repulsive elements, (Figure 1B #24), for increasing the repulsive force of the flexure elements, (Figure 1B #22), when the flexure elements, (Figure 1B #22), supporting the moveable element, (Figure 1B #21), are resiliently deformed by a predetermined amount during movement of the moveable element, (Figure 1B #25).

4. Referring to claim 5, the MEMS device, wherein the moveable element, (Figure 1B #25), moves in a direction perpendicular to the plane of the substrate, (Figure 1B #11a).

5. Referring to claim 13, a MEMS device having flexure elements, (Figure 1B #22), with non-linear restoring force, comprising: a substrate, (Figure 1B #11a); support elements, (Figure 1B #21), located on the substrate, (Figure 1B #11a); a moveable element, (Figure 1B #22), suspended over the substrate, (Figure 1B #11a), by the support elements, (Figure 1B #21), so as to be moveable; flexure elements, (Figure 1B #22), for elastically suspending the moveable element, (Figure 1B #25), on the support elements, (Figure 1B #21); repulsive elements, (Figure 1B #24), for increasing the repulsive force of the flexure elements, (Figure 1B #22), when the flexure elements, (Figure 1B #22), supporting the moveable element, (Figure 1B #25), are resiliently deformed by a predetermined amount in a direction, while permitting the moveable element, (Figure 1B #25), to further move in said direction subject to said increase repulsive force.

6. Referring to claim 16, a MEMS device, wherein the stoppers, (Figure 1B #24), are formed on middle portions of the flexure elements, (Figure 1B #22), opposite to the static

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elements, (Figure 1B #15), so that the stoppers, (Figure 1B #24), contact the static elements, (Figure 1B #15), when the flexure elements, (Figure 1B #22), are resiliently deformed by a predetermined amount.

7. Referring to claim 17, a MEMS device, wherein the moveable element, (Figure 1B #25), moves in a direction perpendicular to the plane of the substrate, (Figure 1B #11a).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2-3, 6-8, and 14-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Japanese Patent Publication No. 2000-164104 Seki.

8. Referring to claim 2, the MEMS device, wherein the repulsive elements include stoppers, (Figure 1B #24), having a predetermined size positioned between the flexure elements, (Figure 1B #22), and static elements, (Figure 1B #15), the static elements being fixed on the substrate, (Figure 1B #11a), opposite to the flexure elements, (Figure 1B #22).

** Seki discloses the claimed invention except for the stoppers being mounted on the substrate. It would have been obvious to one having ordinary skill in the art at the time the invention was made to mount the stoppers onto the substrate instead of having them mounted on

the flexures, since it has been held that a mere reversal of the essential working parts of a device involves only routine skill in the art. In re Einstein, 8 USPQ 167.

9. Referring to claim 3, the MEMS device, wherein the stoppers, (Figure 1B #24), are positioned at portions of the static elements, (Figure 1B #15), opposite to the flexure elements, (Figure 1B #22), so that middle portions of the flexure elements, (Figure 1B #22), contact stoppers, (Figure 1B #24), when the flexure elements, (Figure 1B #22), are resiliently deformed by a predetermined amount.

** Seki discloses the claimed invention except for the stoppers being mounted on the substrate. It would have been obvious to one having ordinary skill in the art at the time the invention was made to mount the stoppers onto the substrate instead of having them mounted on the flexures, since it has been held that a mere reversal of the essential working parts of a device involves only routine skill in the art. In re Einstein, 8 USPQ 167.

10. Referring to claim 6, the MEMS device, wherein the moveable element, (Figure 1B #25), moves in a direction perpendicular to the plane of the substrate, (Figure 1B #11a).

11. Referring to claim 7, the MEMS device, wherein the moveable element, (Figure 1B #25), moves in a direction perpendicular to the plane of the substrate, (Figure 1B #11a).

12. Referring to claim 8, the MEMS device, wherein the moveable element, (Figure 1B #25), moves in a direction perpendicular to the plane of the substrate, (Figure 1B #11a).

13. Referring to claim 14, a MEMS device, wherein the repulsive elements, (Figure 1B #24), include stoppers, (Figure 1B #24), having a predetermined size and are positioned between the flexure elements, (Figure 1B #22), and static elements, the static elements, (Figure 1B #15), being fixed on the substrate, (Figure 1B #11a), opposite to the flexure elements, (Figure 1B #22).

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** Seki discloses the claimed invention except for the stoppers being mounted on the substrate. It would have been obvious to one having ordinary skill in the art at the time the invention was made to mount the stoppers onto the substrate instead of having them mounted on the flexures, since it has been held that a mere reversal of the essential working parts of a device involves only routine skill in the art. In re Einstein, 8 USPQ 167.

14. Referring to claim 15, a MEMS device, wherein the stoppers, (Figure 1B #24), are positioned at portions of the static elements, (Figure 1B #15), opposite to the flexure elements, (Figure 1B #22), so that the middle portions of the flexure elements, (Figure 1B #22), contact the stoppers, (Figure 1B #24), when the flexure elements, (Figure 1B #22), are resiliently deformed by a predetermined amount.

** Seki discloses the claimed invention except for the stoppers being mounted on the substrate. It would have been obvious to one having ordinary skill in the art at the time the invention was made to mount the stoppers onto the substrate instead of having them mounted on the flexures, since it has been held that a mere reversal of the essential working parts of a device involves only routine skill in the art. In re Einstein, 8 USPQ 167.

Allowable Subject Matter

15. Claims 9-12 and 18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Victor A Mandala Jr. whose telephone number is (703) 308-6560. The examiner can normally be reached on Monday through Thursday from 8am till 6pm..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan Flynn can be reached on (703) 308-6601. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

EXAMINER
VICTOR A. MANDALA JR.
TECHNOLOGY CENTER 2800

VAMJ
1/20/04